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(71) Applicants Eyelet Specialty Co Inc., (USA-Florida), Wallingford, Connecticut 06492, United States of America.
(72) Inventors J. Michael McArdle
(74) Agent and/or Address for Service R.G.C. Jenkins and Co., 12-15 Fetter Lane, London EC4A 1PL.

(54) **Cosmetic container**

(57) A lipstick or like cosmetic container wherein the component parts of the container are of moulded plastics and therefore of relatively light weight is provided with a deadweight mass, preferably a steel ball 30, located within the base end of the container to improve the balance of the container when loaded with cosmetic substance. The mass of the deadweight is of the same order of magnitude as the mass of cosmetic substance 19 initially provided in the container.

FIG. 2.

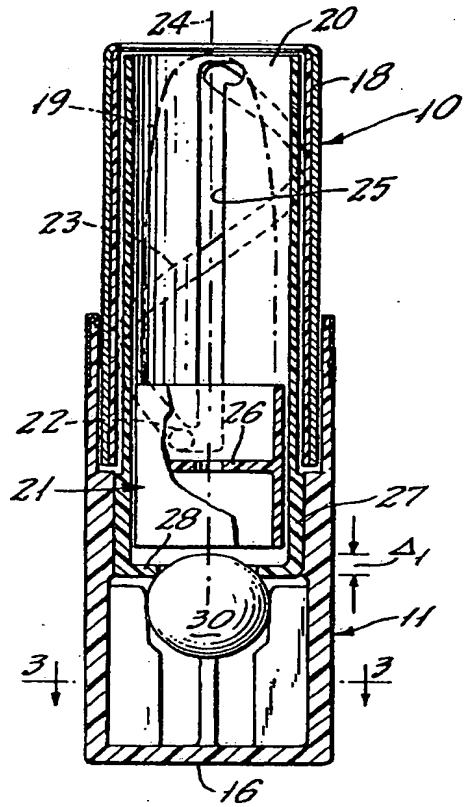

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FIG. 1.

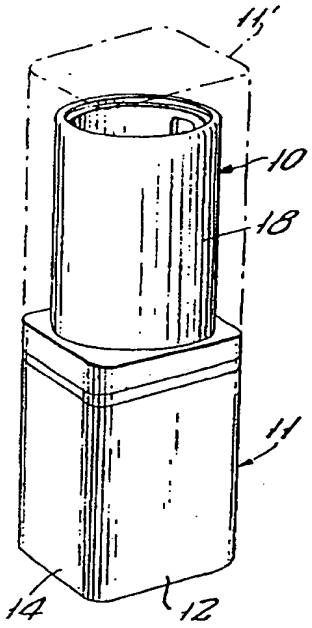


FIG. 2.

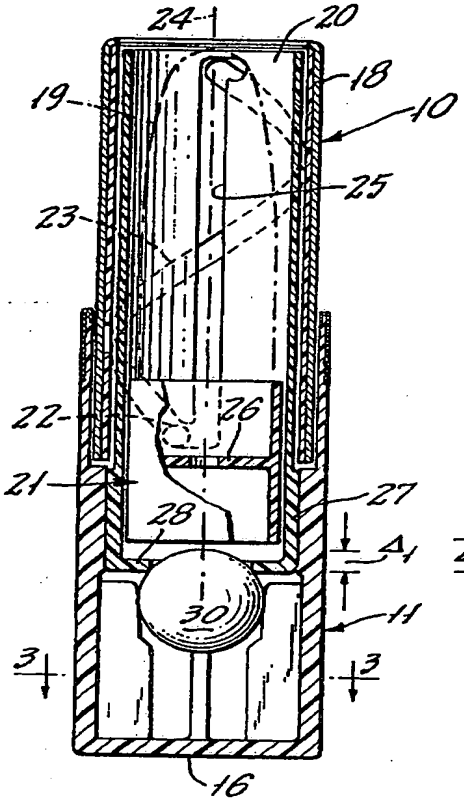


FIG. 4.

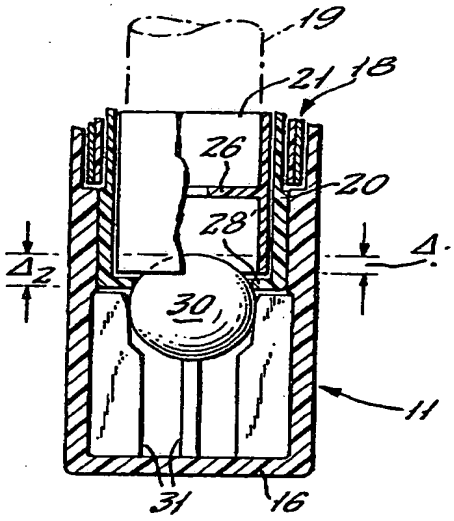


FIG. 6.

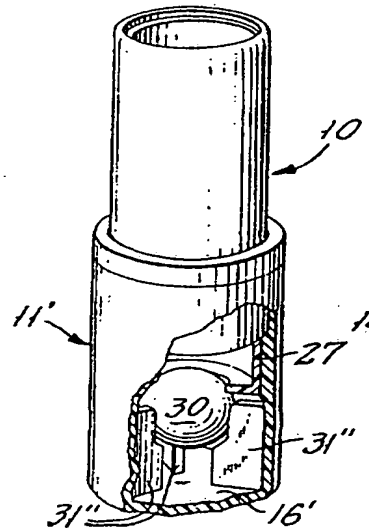


FIG. 3.

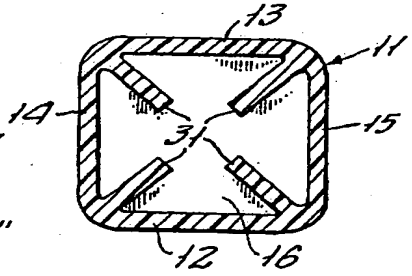
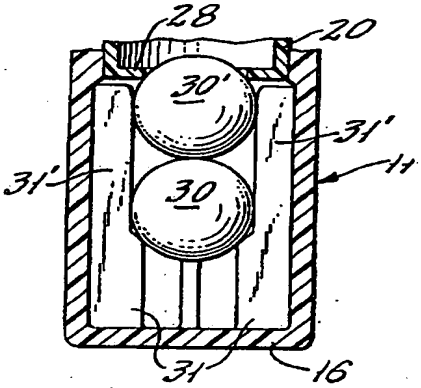


FIG. 5.



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SPECIFICATION

Cosmetic container

The invention relates to cosmetic or the like containers wherein cosmetic or the like containers wherein cosmetic substance is to be axially dispensed or consumed beyond one axial end of the container and wherein the component parts of the container are of molded plastic and, therefore, of relatively light weight.

Current techniques in the injection-moulding of plastic components of containers of the character indicated result in product, exclusive of closure cap, having a weight which approximates the weight of the container's capacity for cosemtic substance. This circumstance produced an odd "feel", of insubstantiality and lack of balance, and creates an impression of lack of quality. The lack of balance and appearance of lesser quality are most noticeable to the customer who has experienced use of a cosmetic container of all-metal or substantially all-metal construction, such metal containers being substantially foreclosed from today's market, for economic reasons.

The undesirable lack of balance in today's plastic products is particularly objectionable in a swivel container wherein relatively rotatable tubular parts are actuated to selectively develop propel/repel displacement of the cosmetic substance. And the highly competitive nature of the plastic-container industry, coupled with ever-rising cost of materials, forecloses hope of solving the problem of balance through addition of mass via the injection-molded parts *per se*.

It is an object of the invention of provide an improved container construction of the character indicated, featuring substantially improved balance at no sacrifice to the economics of plastic injection-moulded components of container.

A specific object is to provide such a container with a permenantly retained deadweight mass, so proportioned to the cosmetic-substance mass and so located with respect to the location of the cosmetic-substance mass as to enhance the balance of the container and thereby to facilitate its operation and use.

Another specific object is to achieve the above objects in a construction which inherently lends itself to automated container assembly.

A further specific object is to achieve the above object with a construction which inherently lends itself to utilisation of conventional injection-molded plastic parts and molding techniques, thus involving minimum incremental cost, as compared with existing container-manufacturing techniques.

The invention achieves these objects and certain further features by providing internal features in the base of a cosmetic container, such that a deadweight mass of relatively high-density material is located near the cosmetic substance and such that the mass of the deadweight approximates or is in the order of magnitude of the mass of the cosmetic substance. In the preferred form, the deadweight mass is provided by a steel ball, which may have been manufactured as a component of a conventional ball bearing, and the dimensional constants of the ball and its retained location are selected for achievement of desired balance in the complete container, when loaded with its predetermined mass of cosmetic substance.

The invention will be illustratively described in detail, in conjunction with the accompanying drawings, in which:

Figure 1 is a view in perspective of a cosmetic container incorporating the invention;

Figure 2 is an enlarged and simplified view in longitudinal section of the container of Figure 1;

Figure 3 is a transverse section, taken at 3-3 in Figure 2;

Figure 4 is a fragmentary sectional view similar to Figure 2, but showing a modification;

Figure 5 is another fragmentary sectional view to show another modification; and

Figure 6 is a simplified view in perspective, partly broken-away and in longitudinal section, to show application of the invention to a cosmetic container of different overall design, as compared to that of Figure 1.

Referring initially to Figure 1, the invention is shown in application to a cosmetic container of the variety wherein a basic cartridge 10 for the containment and dispensing of cosmetic substance via its open upper end is permanently assembled to the base half 11 of a decorative outer casing. The remaining half 11' of the outer casing is a removable closure cap which in Figure 1 is suggested by phantom outlines. The particular external shape of the casing 11-11' has nothing to do with the invention, but for greater clarity in later identification of parts, the external shape which is shown will be briefly described in the additional context of Figures 2 and 3.

The overall shape of casing 11-11' presents a generally rectangular-prismatic appearance, having the generally square transverse section depicted in Figure 3. Thus, the base half 11 has a first pair of opposed parallel elongate walls 12-13, and a second pair of similar opposed walls 14-15. The base half 11 is an upwardly open cup with a closed bottom end wall 16 which is normal to the central axis of the container. The upper edge of base half 11 happens to lie in a plane that is normal to the central axis of the container. The upper or closure-cap half 11' of the casing is of similar external profile, being characterised by an open lower-edge which lies in a plane normal to the container axis, to match the adjacent edge of base half 11.

The container cartridge (10) shown as of the propel-repel variety, and in Figure 1 the outer tubular member 18 of cartridge 10 is exposed, beyond the upper otherwise-open end of base half 11 of the casing. Cosmetic substance 19 contained within cartridge 10 is projected and retracted via the open upper end of the cartridge, upon manual rotation of base 11 with respect to outer tubular member 18. And it will be understood that friction means (not shown) within closure cap 11' is the means of removably retaining cap 11' in assembled relation to the container parts of Figure 1, via member 18 engagement.

More particularly, cartridge 10 is seen in Figure 2 to comprise, in addition to outer member 18, an innular tubular member 20 and a carrier 21 for the cosmetic substance 19. Tubular members 18-20 are axially retained but relatively rotatable and have cam formations engaged and tracked by cam-follower means 22 integrally formed with carrier 21. As shown, the cam formation 23 of outer tubular member 18 is an internal groove, of helical course along the cartridge axis 24, and the cam formation 25 of inner tubular member 20 is a straight slot, terminating in short lateral offsets, for purposes of snap-action retention of the respective limits of carrier displacement. Carrier 21 is an elongate cylindrical shell having a central platform or ledge 26 to limit the region of support of cosmetic substance 19. And the lower end of outer tubular member 18 is circumferentially enlarged at 27 below the lower end of cam 23 to provide body for force-fit permanent engagement to the bore of the casing base 11. Base-end stiffness of member 18 is further enhanced by an end-wall formation 28 which is annular.

All structural parts thus far described may be of injection-molded plastic and therefore of relatively little mass. In fact, even for a highly decorative container, such as the one described with aesthetic features in connection with Figure 1, the entire weight of the container i.e., cartridge 10 in press-fitted assembly to decorative base 11, is only approximately 10 grams, for a container size in which a pomade of cosmetic substance 19 weight 5 grams. And, noting the fact that the center of gravity of the pomade 19 is at a location near the upper end of the assembly of Figure 2, there is a clear unbalance in the distribution of mass, for the loaded container, and this unbalance worsens, either for the use condition of pomade 19 fully propelled, or for the non-use condition of the closure cap 12 in place, the latter involving typical additional weight of about 4 grams, again local to the upper end of the container.

I have found that the indicated off-balance or unbalance conditions may be very largely offset by incorporating a fixed high-density deadweight mass 30 a as single mechanical element retained within base casing 11 upon permanent assembly of cartridge 10 thereto. In particular, I have found that a conventional steel ball-bearing ball is ideally suited to the purpose, being commercially available in a plurality of specific sizes and, therefore, inherently lending itself to precise determination of mass best suited for the particular pomade (19) mass of the particular container. It is my preferance that the deadweight 30 be centrally located adjacent the base end of the cartridge 10, and as shown this is achieved by providing elongate upstanding ribs 31 to characterise the bore of the casing base 11, ball 30 being centrally nested in upper sloping edges of ribs 31, and being also centrally trapped by the circular edge of the bottom opening in the annular wall 28 of cartridge member 18.

The convergent taper of ribs 31 into which the deadweight ball 30 is nested is preferably a small-angle taper (as in the range 3 to 7 degrees), so as to assure ball entrapment and positive retention regardless of such small tolerance variations as may characterise the formation of the inner edges of ribs 31. Thus, ball 30 may ultimately be retained at an axial location which reflects such variations, but the retention will always be positive, and it will be understood that the retaining fit of wall 28 to the ball may mean a corresponding variation in the ultimate axial position of the cartridge 10 in its assembly to base casing 11; these variations are, however, insignificant to ultimate appearance and/or balance of the completed container.

As shown in Figure 2, ball 30 is retained by entry to the extent Δ_1 into the central opening of wall 28, and this location is at substantial offset from the closed bottom end 16 of the casing base 11. For the component weights given above, I find that a bearing ball 30 of 0.406-inch diameter (weighing 4.5 grams) produces a significant improvement in balance and materially facilitates use of the described container, it being noted that the deadweight (30) mass approximates the usable mass of pomade (19), inasmuch as a 5 gram pomade is usable only to the top plane of carrier 21, at which point unusable pomade remaining in the carrier weighs litte more than a gram.

Aside from the precision with which a bearing ball 30 lends itself to the balance function achieved by the invention, it has also been found that a bearing ball 30 is ideally suited to automated assembly of the container. Initially, the cartridge 10 will be understood to be an assembled, unit positioned by suitable jig means and in inverted orientation, i.e. with the end wall 28 thereof facing upward; and it will be further understood that cartridge 11 may be one of a large plurality of similarly oriented cartridges 10, in longitudinally spaced array, as on a moving conveyor. The central opening of each such wall 28 provides a perfect self-centering support for an applied ball 30, poised to receive press-fitted application of an inverted casing base 11; the press-fit may be permanently secured, for the case of thermoplastic components using ultrasonic welding techniques. Preferably, the force and displacement involved in such press-fitted assembly are sufficient to so engage ball 30 to the edge of the central opening in wall 28 that wall 28 is slightly axially deflected, allowing the axially compliant nature of wall 28 to constantly apply residual axially compressive loading of ball 30, for permanent anti-rattle support of the same.

Much of what appears in Figure 4 will be recognised from the description of Figure 2, and therefore the same reference numerals are used, as applicable. Figure 4 illustrates the situation in which ball 30 is in even more closely nested relation with cartridge 10, by reason of a larger diameter ball-engaging opening in cartridge end wall 28'. This being the case, the described compliantly loaded support of ball 30 occurs for a deeper penetration Δ_2 of ball 30 into the base end of the cartridge, coupled with ball (30) reception within the base-end included volume of the carrier 21, to the extent Δ_3.

The modification of Figure 5 serves to illustrate elongate rib formations 31' integrally formed with the convergent rib formations 31, whereby still

further deadweight mass may be assembled into the base end of the described container. Opposed rib formations 31' are at such diametral spacing as to recieve one or more inserted deadweight balls 30-30', and once the described press-fit is achieved, the upper ball 30' derives its centering location from the opening in cartridge wall 28, while ball 30 derives its centering location from the sloping upper ends of rib formations 31. Balls 30-30' are in axially pre-loaded self-centering contact and alignment, by reason of the above-described compliantly stressed fit of the cartridges to the casing half 11. And it will be understood that to achieve the press-fitted assembly with plural balls 30-30', the casing base 11 and cartridge 10 should be in upright orientation when press-fitted to each other.

The described container will be seen to achieve all stated objects. Superior balance is achieved with no added complexity or cost of injection-molding of plastic materials. The balance purposes of the invention can be achieved with ample precision for cosmetic-container purposes, using bearing balls 30 of far less precision than required for precision-bearing purposes. The incremental cost of balls 30 is therefore small, as is also the incremental cost of automated assembly, in that a ball 30 requires no orientation and is self-centering. Further, for a given set of plastic components, a range of ball (30) sizes (and therefore a range of deadweight mass) is accommodatable in the described internal contouring relied upon for ball positioning.

While the invention has been described in detail for the form illustrated, it will be understood that modifications may be made without departing from the scope of the invention. For example, it will be understood that in Figure 2 to 5, wall thickness for the casing bore 11 has been shown with exaggeration and lack of detail, for reasons of simplicity, in that such detail is unimportant to the present invention.

Also for example, centrally stabilised support of the deadweight mass 30 needs only three points of contact, the four-point support afforded by ribs 31 being only convenient for the particular generally square-section casing base 11 shown. Figure 6 provides illustration of such three-point support, by ribs 31" in a so-called round 50:50 container configuration, as compared to the somewhat square configuration of Figure 1, the 50:50 applying to approximate equality of exposed length of the base 11 and of the cover cap 11', when the cover cap is in place.

CLAIMS

1. A cosmetic or the like container, comprising relatively rotatable inner and outer tubular members having propulsion-cam formations, a carrier within the inner tubular member and having cam-follower means engaged to the cam formations of said members, at least one of said members being at least partially closed at one end and both of said members being open to dispense cosmetic substance via the other end, a cup-shaped elongate outer casing having a closed lower end and a bore open at its other end, means securing said one end of said one member in said bore, with the other end of the other member exposed beyond the open end of said casing, and a deadweight mass of relatively dense material as compared with the density of the materials of said members, said deadweight mass being confined within said bore and beneath said one end of said one member.

2. The container of claim 1, in which in the region beneath said one end of said one member said bore is characterised by at least three angularly spaced elongate and radially inwardly directed ribs, and in which said deadweight mass is a metal ball centrally stabilised by contact with said ribs.

3. The container of claim 1, capacitated for the selectively dispensable containment of a predetermined mass of cosmetic substance, said deadweight mass being substantially equal to said predetermined mass.

4. The container of claim 1, wherein said carrier is capacitated for the retention of a predetermined mass of unusable cosmetic substance after usable cosmetic substance has been fully dispensed via said other end of said members, said deadweight mass substantially exceeding said predetermined mass.

5. The container of claim 1, in which said deadweight mass is at axial offset from the closed end of said outer casing.

6. The container of claim 1, in which said deadweight mass is confined at least partially by direct contact with said one end of said one member.

7. A cosmetic or the like container, comprising a tubular member open at one end and means within said member adapted for the cantilevered support of cosmetic substance extending through and beyond said open end, annular means at least partially closing said other end of said member, said annular means defining a central locating edge having its center on the axis of said tubular member, and a cup-shaped elongate outer casing having a closed lower end and a bore open at its other end, means securing said other end of said tubular member in said bore at axial offset from the closed end thereof, and a deadweight metal ball trapped in said bore beneath said tubular member and coaxially defined by said locating edge.

8. The container of claim 7, in which said locating edge is in the rim of a central aperture in the bottom-closure wall of said tubular member, said closure wall being in axially stressed engagement with said metal ball.

9. The container of claim 8, in which ball-centering ribs characterise the internal profile of said bore, said ribs providing ball-positioning support at substantial axial offset from the closed lower end of said outer casing.

10. The container of claim 8, in which said deadweight ball is one of two in coaxially retained axially successive array within said bore.

11. The container of claim 1, in which the part of said bore which supports said deadweight mass is contoured with a low-angle convergent taper.

12. The container of claim 2, in which the portion of said ribs which contacts said ball is characterised

by a low-angle downward convergence.

13. The container of claim 7, in which the part of said bore which supports said ball is contoured with a low-angle convergent taper, said tubular member being in such forced abutment with said ball as to jam the ball in said convergent taper.

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